

**Clean Version of the Entire Set of Pending Claim**

- 1 1. A router comprising:
  - 2 a) a first port for receiving a packet having a first label, a header and a payload;
  - 3 b) a first table, from among one or more separate tables associated with
  - 4 different labels, associated with the first label; and
  - 5 c) a processor for processing the packet in accordance with the first table.
- 1 2. The router as recited by claim 1 wherein in the table is a route table.
- 1 3. The router as recited by claim 1 wherein the table is a forwarding table.
- 1 4. The router as recited by claim 1 wherein the label identifies a virtual private
- 2 network.
- 1 5. The router as recited by claim 1 further having a second port for
- 2 transmitting said packet.
- 1 6. The router as recited by claim 1 wherein the header is an internet protocol
- 2 header.
- 1 7. The router as recited by claim 1 wherein the label comprising information
- 2 identifying a virtual private network and a forwarding label.
- 1 8. A method of routing in a network comprising:
  - 2 a) maintaining a first table corresponding to a first virtual private network;

3 b) maintaining a second table corresponding to a second virtual private network;

4 and

5 c) routing a packet based on a pre-existing association with the first table or the  
6 second table.

1 9. The method as recited by claim 8 wherein the first table and the  
2 second table are route tables.

1 10. The method as recited by claim 8 wherein the first table and the  
2 second table are forwarding tables.

1 11. The method as recited by claim 9 further comprising the step of  
2 maintaining forwarding table indexable by a virtual private network  
3 identifier.

1 12. The method as recited by claim 8 wherein the packet comprises a  
2 label, a header and a payload.

1 13. The method as recited by claim 8 wherein the label comprises  
2 information identifying a virtual private network.

1 14. The method as recited by claim 8 wherein the label comprises  
2 information identifying a virtual private network and a forwarding label.

1 15. The method as recited by claim 9 wherein the first table or the second  
2 route table is chosen for routing the packet based on the label.

1 16. A method of routing in a network comprising:  
2 a) maintaining a first forwarding table corresponding to a first virtual private network;  
3 b) maintaining a second forwarding table corresponding to a second virtual private  
4 network; and  
5 c) routing a packet based on a pre-existing association with the first forwarding table  
6 or the second forwarding table.

1 17. The method as recited by claim 16 wherein the packet comprises a label, a  
2 header and a payload.

1 18. The method as recited by claim 16 wherein the label comprises  
2 information identifying a virtual private network.

1 19. The method as recited by claim 16 wherein the label comprises  
2 information identifying a virtual private network and a forwarding label.

1 20. The method as recited by claim 16 wherein the first table or the  
2 second table is chosen for routing the packet based on the label.

1 21. A network comprising:

2 a) a first edge router configured to receive a packet having a header and to transmit  
3 into a wide area network cloud a modified packet having a label and the header;  
4 b) a backbone router configured to receive the modified packet and route the  
5 modified packet based on a route table associated solely with the label, from among  
6 one or more separate route tables associated with different labels; and

7 c) a second edge router configured to receive the modified packet.

1 22. The network as recited by claim 21 wherein the label comprises  
2 information identifying a virtual private network.

1 23. The network as recited by claim 21 wherein the label comprises  
2 information identifying a virtual private network and a forwarding label.

1 24. The network as recited by claim 21 wherein the backbone router comprises a  
2 second route table.

1 25. The network as recited by claim 21 wherein the modified packet further  
2 includes,  
3 a second label identifying a forwarding table corresponding to the virtual  
4 private network, the forwarding table including a portion of the route table.

1 26. A method of routing a packet comprising:  
2 a) identifying, by a label, a packet including the label, a header and a payload  
3 destined for a virtual private network (VPN);  
4 b) identifying, from the label, a routing table associated with the VPN from  
5 among multiple separate routing tables associated with different labels; and  
6 c) facilitating routing of the packet to the VPN.

1 27. The method of claim 26, wherein the label includes a virtual private network  
2 identifier.

1 28. The method of claim 26, wherein the routing of the packet is based on  
2 information in the header.

1 29. The method of claim 28 further comprising:  
2 identifying, from a second label, a forwarding table corresponding to the VPN,  
3 the forwarding table including a portion of the routing table.

1 30. The method of claim 29 further comprising:  
2 identifying, from the forwarding table, label switching information for routing  
3 the packet to the VPN.

1 31. The method of claim 30, wherein routing of the packet is based on  
2 information in the forwarding table.

1 32. The method of claim 26 wherein the label includes a forwarding label  
2 corresponding to a forwarding table.